INDUSTRY AND LITIGATION EXPERIENCE
(omits activities during tenure as Deputy Assistant Attorney General)

TESTIMONY

Semiconductor Markets

Testimony on behalf of Intel Corporation regarding competition in semiconductor markets, 1990-92.

Computer Software

Appearance before the Federal Trade Commission on behalf of IBM and Lotus Corporation, 1995.

Computer Maintenance Services

Testimony on behalf of Datagate and Hy-Point technology regarding market definition, 1988-90.

Computer Reservation Systems

Deposition testimony on behalf of System One regarding competitive impacts of practices in the airline computer reservation systems industry, 1989.

Electric Power Markets

Testimony on behalf of the California Public Utility Commission on the impacts of merger in bulk electric power markets, 1989-90.

Testimony on behalf of the Chevron Corporation regarding California Energy Commission siting policy for self-generation facilities, 1985-87.

Financial Markets

Deposition testimony in a class action regarding competitive impacts of savings and loan lending practices, 1982-84.

Deposition testimony in a class action regarding competitive impacts of bank lending practices, 1986.

Geothermal Industry

Testimony on behalf of R.C. Dick Geothermal involving competitive impacts of geothermal field development, 1983-85.

Intellectual Property

Testimony on behalf of Conlux Corporation regarding damages for infringement of electronic coin vending machines, 1992.

Testimony on behalf of Universal Manufacturing involving antitrust and contractual issues in technology development, 1988-89.

Deposition testimony on behalf of Nicolet regarding damages for infringement of semiconductor inspection equipment patent, 1989.

Petroleum Industry

Testimony on behalf of Chevron Corporation regarding crude oil refinery economics, 1991.

Uranium Industry

Testimony on behalf of Chevron Corporation regarding price formation in the uranium fuels industry, 1987-89.

INDUSTRY ANALYSIS

Energy Markets (general)

Formulation of a framework for the Federal Energy Agency for public policy intervention in exhaustible resource markets, 1975-77.

Examination for the Electric Power Research Institute of the effects of risk on the supply of and demand for energy resources. Development of methods for estimating impacts of risk on energy prices and quantities traded in markets, 1976-78.

Analysis for the World Bank of implications of resource limitations and market organization for the economies of developing countries, 1976-82.

Analysis for the Electric Power Research Institute of alternative strategies to mitigate impactsof energy supply disruptions, 1980-82.

Electric Power

Analysis for the Electric Power Research Institute of utility regulatory policies and their consequences for risk-sharing between stockholders and ratepayers, 1982-86.

Analysis of nuclear plant construction economics, 1983.

Chemicals

Analysis on behalf of the U.S. Federal Trade Commission regarding competitive impacts of investment in the titanium dioxide industry, 1978-79.

Petroleum Markets

Evaluation for British Petroleum, Ltd of the effects of contracting policies on the supply, price, and reliability of energy resources, 1978-80.

Analysis for the Chevron Corporation of crude oil refining and transportation economics, 1984-91.

Telecommunications

Consultant to Bell Telephone Laboratories, Murray Hill, NJ, Summer 1982. Evaluation of rate of adoption of new telecommunications technologies.

Analysis for Bell Atlantic of adoption rates for new technologies and development of strategies for the introduction of new telecommunications products and services, 1985-85.

Other

Analysis of the effects of alternative pricing practices for Automated Teller Machines, 1988.

Analysis of competitive behavior in the wood-pulp processing industry, 1984.

Analysis of pricing practices in the retail recorded media market, 1985.

ROBERT G. HARRIS

Law & Economics Consulting Group, Inc.
2000 Powell Street, Suite 600
Emeryville, CA 94608
Tel. (510) 653-9800
Fax (510) 653-9898

University of California
Haas School of Business
Berkeley, CA 94720
Tel. (510) 642-0961
Fax (510) 642-2826

EDUCATION

Ph.D., M.A., UNIVERSITY OF CALIFORNIA, Economics, Berkeley, 1973-77.
Fields of Emphasis: Industrial Organization, Antitrust, Regulation, Public Finance.
M.A., B.A., MICHIGAN STATE UNIVERSITY, Social Science, 1961-65, 1972-73.

PRESENT POSITION

HAAS SCHOOL OF BUSINESS, UNIVERSITY OF CALIFORNIA, Berkeley, 1977 - present.
Associate Professor, Business & Public Policy Group; and
Co-Director, Consortium for Research in Telecommunications Policy and Strategy

LAW & ECONOMICS CONSULTING GROUP, 1993-present.
Principal-in-Charge, Regulation Practice Group

ACADEMIC HONORS AND AWARDS

Industry Expert Panel, Center for Telecommunications Management, University of Southern California
Charles C. Slater Award (outstanding contribution to the Journal of Macromarketing, 1983-86).
Schwabacher Prize (outstanding University service), 1983.
Phi Beta Kappa, 1977.
Alfred P. Sloan Dissertation Fellowship, 1975-77.
Blue Key and Excalibur Honorary Fraternities, 1964-65.
President, All-University Student Government, 1964-65.

TEACHING

Graduate Courses: Business and Public Policy (MBA Core Course), Competitive Strategies & Public Policies in Telecommunications, Microeconomic Analysis for Managerial Decisions, Industry Analysis and Competitive Strategy, Doctoral Research in Business & Public Policy, Antitrust Law (School of Law, with L. Sullivan), Antitrust Economics (Department of Economics).

Undergraduate Courses: Social and Political Environment of Business (Core Course), Economics of Regulated Industries, The Corporation and the Global Economy.

Executive Education: Competitive Strategy, Telecommunications Policy and Strategy, Public Policy Strategy, Managing Business-Government Relations.

PUBLICATIONS

"Competition and Public Policies in Telecommunications: A Survey of U.S. Developments," presented to Conference on Privatization and Deregulation in the US, UK and Japan, Economic Research Institute of the Economic Planning Agency of Japan, Tokyo, 1995; forthcoming in *Conference Proceedings*.

"Competition and Unbundling in Local Telecommunications: Implications for Antitrust Policy," with Gregory L. Rosston and David J. Teece, presented to Telecommunications Policy Research Conference, Solomons, Maryland, October 1994; forthcoming in *Conference Proceedings*, EAL Press.

"State Regulatory Policies and the Telecommunications/Information Infrastructure," presented to Workshop of the National Research Council, Washington D.C., October 1993; *The Changing Nature of Telecommunications/Information Infrastructure*, National Academy Press, 1995.

"Access and Competition Policy in the Deregulated Rail Freight Industry, with Comparisons to Competitive Access Issues in Telecommunications," with Curtis M. Grimm, presented to Columbia Institute for Telecommunications and Informatics, New York, November 1993; forthcoming in *Conference Proceedings*, Oxford University Press.

"R&D Expenditures by the Bell Operating Companies: A Comparative Assessment," invited paper, Twenty-Third Annual Conference, Michigan State University Institute of Public Utilities, Williamsburg, Virginia, December 9, 1991; *MSU Public Utility Conference Proceedings*, 1993.

"Strategic Uses of Regulation: The Case of Line-of-Business Restrictions in Communications," with Robert A. Blau, presented to Academy of Management, Miami, FL, August 14, 1991; *Research in Corporate Social Performance and Policy*, James E. Post (ed.), JAI Press, 1992.

"Structural Adjustment Through Industry Deregulation: The U.S. Experience in Telecommunications and Transportation," invited paper, Pacific Economic Cooperation Conference on Structural Adjustment, Kyoto, Japan, October 11, 1990; published in *PECC Conference Proceedings*, 1991.

"Gaining Competitive Advantage through Strategic Public Policies: The Case of Japanese Telecommunications," invited lecture, National Economists Club, Washington, D.C., June 1988; published in *Economics and the Public Interest*, Richard T. Gill (ed.); Mayfield Publishing: Mountain View, CA, 1991.

"The Political Economy of Regulation: Analysis of Market Failures and Regulatory Responses," with James A. Carman, *Scaling the Corporate Wall: Readings in Social Issues of the Nineties*, S. Prakash Sethi, Paul Steidlmeier and Cecilia M. Falbe (eds.); Prentice-Hall: Englewood Cliffs, 1991.

"Telecommunications Services as a Strategic Industry: Implications for United States Policy," *Competition and the Regulation of Utilities*, Michael A. Crew (ed.), Kluwer Academic Publishers: Boston, 1990.

"Telecommunications as a Strategic Industry: Is There a Threat?" *Powernomics: Economics and Strategy After the Cold War*, Clyde V. Prestowitz, Jr., Ronald Morse and Alan Tonelson (eds.), University Press of America, 11. Reprinted from *Vital Speeches of the Day* LV(12), April 1989. Invited lecture, New York University Symposium on Telecommunications and Economic Development, December 1988.

"New Plans for Joint Ventures," with David C. Mowery, *The American Enterprise*, Sept/Oct 1990.

"Strategies for Innovation: An Overview," with David C. Mowery, *California Management Review* 32(3), Spring 1990, Co-Editor of Special Issue, "Strategies for Innovation."

"The Implications of Divestiture and Regulatory Policies for Research, Development and Innovation in the U.S. Telecommunications Industry," presented to Telecommunications Policy Research Conference, September 1988; *Telecommunications Policy*, April 1990.

"Telecommunications Policies in Japan: Lessons for the U.S.," presented to Advanced Workshop in Regulation and Public Utility Economics, Monterey, CA, July 1988; presented to Telecommunications Policy Research Conference, October 1988; *California Management Review* 31(3), Spring 1989.

"California Telecommunications Policy for the Twenty-First Century," *Report to the California Economic Development Corporation*, Sacramento, June 1988.

"A Qualitative Choice Analysis of Rail Routings: Implications for Vertical Foreclosure and Competition Policy," with Curtis A. Grimm, *The Logistics & Transportation Review*, March 1988.

"Horizontal Merger Policy: Promoting Competition and American Competitiveness," with Lawrence A. Sullivan, *Antitrust Bulletin*, January 1987.

"The Political Economy of Regulation," with James M. Carman, *Business & Society*, S.P. Sethi and C. Falbe (ed.), Lexington Books: Lexington, 1987.

"Public Regulation of Market Activity: Regulatory Failures," with James M. Carman, *Journal of Macromarketing*, Spring 1986.

"The Effects of Railroad Mergers on Industry Productivity and Performance," with Curtis M. Grimm, invited paper to Transportation Research Board, National Academy of Engineering, January 1986; *Transportation Research Record* 1029, 1986.

"Revitalization of the U.S. Freight Industry: An Organizational Perspective," with Curtis M. Grimm, *International Railway Economics*, K. Button & D. Pitfield (eds.); Crower: London, 1985.

"The Values of Economic Theory in Management Education," *The American Economic Association Papers & Proceedings* 74(2), May 1984.

"Public Regulation of Market Activity: Regulatory Responses," with James M. Carman, *Journal of Macromarketing*, Spring 1984.

"Antitrust Market Definition: An Integrated Approach," with Thomas M. Jorde, *California Law Review* 72(1), January 1984. Reprinted in *Corporate Counsel's Annual*, Matthew Bender, 1985. Reprinted in *Antitrsut Anthology*, edited by A. I. Gavil, Anderson Publishing, 1995.

"Structural Economics of the U.S. Rail Freight Industry: Concepts, Evidence and Merger Policy Implications," with Curtis M. Grimm, *Transportation Research* 17A(4), July 1983.

"Vertical Foreclosure in the Rail Freight Industry: Economic Analysis and Public Policy Prescriptions," with Curtis M. Grimm, *ICC Practioners' Journal*, July 1983.

"Market Definition in the Merger Guidelines: Implications for Antitrust Enforcement," with Thomas M. Jorde. *California Law Review* 71(3), March 1983. Reprinted in *Antitrust Policy in Transition: The Convergence in Law and Economics*. Fox and Halverson (eds.), American Bar Association, 1984.

"Public Regulation of Market Activity: Institutional Typologies of Market Failures," with James M. Carman, *Journal of Macromarketing*, Spring 1983.

"Potential Benefits of Rail Mergers: An Econometric Analysis of Network Effects on Service Quality," with Clifford Winston, *Review of Economics and Statistics* 65(1), February 1983.

"Regulation: A Long Term Perspective," *Business Environment Public Policy: The Field and Its Future*, Edwin M. Epstein and Lee E. Preston (eds.), St. Louis, 1982.

"The Financial Performance and Prospects of Railroads in the South and Southwest," with Curtis M. Grimm, *Texas Business Review*, November/December 1982.

"More on Passing On: A Reply to Cooter and to Viton and Winston," with Lawrence A. Sullivan, *Pennsylvania Law Review* 129:6, June 1981.

Rationalizing the Rail Freight System: Costs and Benefits of Branch Line Abandonments, U.S. Department of Transportation, Washington, D.C., 1981.

"Determinants of Railroad Profitability: An Econometric Study," with Theodore E. Keeler, *Economic Regulation: Essays in Honor of James R. Nelson*, William G. Shepherd and Kenneth D. Boyer (eds.), Michigan State University Press, 1981.

"Passing on the Monopoly Overcharge: A Response to Landes and Posner," with Lawrence A. Sullivan, *Pennsylvania Law Review* 128(5), May 1980.

"Suppliers of Last Resort: Economics of Self-Supply in Common Carrier Industries," with Robert A. Meyer, *Quarterly Review of Economics and Business* 19(4), Winter 1980.

"Economic Analysis of Light Density Rail Lines," *The Logistics and Transportation Review* 16(1), Winter 1980.

"Passing on the Monopoly Overcharge: A Comprehensive Policy Analysis," with Lawrence A. Sullivan, *Pennsylvania Law Review* 128(2), December 1979.

"Rationalizing the Physical Structure of the U.S. Rail Freight Industry," *National Railroad Policy*, Joint Economic Committee, U.S. Congress, Washington, D.C., Government Printing Office, 1979.

"Simple Analytics of Rail Costs and Disinvestment Criteria," *Transportation Research Record* 687, 1978.

"Economics of Traffic Density in the Rail Freight Industry," *Bell Journal of Economics* 8(2), Autumn 1977.

PAPERS, REPORTS, PRESENTATIONS & PROFESSIONAL PROCEEDINGS

"Telecommunications Trade and Investment Opportunities in China and India," presented to the Massachusetts Telecommunications Council, Boston, February 1995.

"The Strategic Implications of Interactive Broadband Telecommunications Networks for Competition and Public Policy," presented to the National Communications Forum, Chicago, September 1994.

"Competitive Implications of Vertical Relations between Equipment Vendors and Telecommunications Services: Lessons from the French Experience," with Joanne Oxley, presented to European Regional Conference of the International Telecommunications Society, Stenungsbaden, Sweden, June 21, 1993.

"Obtaining Competitive Intelligence and Creating Competitive Advantage through the Public Policy Process," with Steven Harris, invited paper, Annual Conference of the Society for Competitive Intelligence Professionals, Los Angeles, April 2, 1993.

"Deployment and Adoption of Integrated Services Digital Network in the U.S.: Progress and Public Policy Obstacles," with Luis Enriquez, invited paper, Twenty-Fourth Annual Conference, Michigan State University Institute of Public Utilities, Williamsburg, Virginia, December 8, 1992.

"Market Definition and Market Power in the Sports and Entertainment Industry," invited presentation, Antitrust Section, American Bar Association Annual Proceedings, San Francisco, August 1992.

"The Design of Incentive Regulation for Telecommunications," invited presentation, Conference on Alternative Regulation, Illinois Commerce Commission. Chicago, July 1992.

"The Effects of Public Policies on ISDN Deployment and Adoption in the U.S.," presented to International Telecommunications Society, Cannes, France, June 1992.

"Removing the MFJ Restriction on InterLATA Services," invited testimony, Subcommittee on Telecommunications & Finance, U.S. House of Representatives, Washington D.C., May 1992.

"The Implications of Telecommunications Infrastructure Investment for R&D, Innovation and Competitiveness," invited testimony, Subcommittee on Communications, U.S. Senate, Washington D.C., February 1992.

"Principles of Costing and Pricing for Telecommunications Regulatory Policy," invited testimony, Colorado Public Utilities Commission En Banc Hearing, Denver, February 1992.

"Deregulation and Interstate Bank Entry in California," with Lee Burke, Research Report of the California Policy Seminar, UC Berkeley, April 1991.

"Assessing the Future of Telecommunications in the Global Economy," invited address, California Telephone Association, Monterey, CA, February 1991.

"Economic Rationale for a National Fiber Optic Infrastructure," invited address, Congressional Staff Forum on Telecommunications (sponsored by Ameritech), Washington D.C., February 1991.

"Applications of Incentive Regulation: An International Comparison," invited presentation, Conference of California Public Utilities Counsel, Long Beach, CA. October 1990.

"The Role of Telecommunications in Regional Economic Development," invited address, Rocky Mountain State Leaders Conference, Billings, Montana, October 1990.

"Telecommunications and Public Policies in the Global Market," invited address, Carnegie Council, New York, NY, October 1990.

"Why We Need a National Telecommunications Policy: A Comparative Perspective," invited address, Policy Issues Management Conference, Bell Communications Research, Murray Hill, NJ, October 1990.

"Incentive Regulation for Telephone Utilities," invited presentation, Workshop of the Colorado Public Utilities Commission, Denver, September 1990.

"The Role of Telecommunications Policy," invited lecture, Conference on Economic Development in the Pacific Northwest, Portland, Oregon, September 1990.

"The Changing Economics of Telecommunications: Implications for U.S. Policy and Competitiveness," invited briefing of U.S. Congressional staff on telecommunications (sponsored by Pacific Telesis), San Francisco, August 1990.

"Communications Competitiveness and Infrastructure Modernization Act of 1990," invited testimony, Communications Subcommittee, U. S. Senate, Washington D.C., July 1990.

"Investing in America's Future," invited essay, 1989 Annual Report of Southwestern Bell Corporation, St. Louis, 1990.

"The Public Switched Telephone Network and Rural Economic Development," invited lecture, Montana State Leaders' Conference, Helena, April 1990.

"Is Public Policy Meeting the Needs of Consumers?" invited panelist, Conference on Telecommunications Technologies and Policies, Center for Communications and Information Science & Policy, University of Pennsylvania, March 1990.

"Telecommunications as a Strategic Industry," invited address, New England Council, Boston, February 1990.

"Fiber to the Customer: A Public Policy Perspective," invited paper, Western Communications Forum, San Diego, February 1990.

Session Chair and Moderator, "State Regulatory Reform: Recent and Future Trends," Fifth Conference on State Telecommunications Regulation, University of Utah, Salt Lake City, January 1990.

Invited Panelist, "Crossroads of Information Technology," Board on Telecommunications and Computer Applications, National Academy of Engineering, Washington D.C., October 1989

Invited panelist in the "Industry Forum," Annual Meeting of the U.S. Telephone Association, San Francisco. October 1989.

"Strategic Lessons from Deregulated Industries," paper presented to Strategic Management Society, San Francisco, October 1989.

"Deregulation in the Transportation Industries: Lessons for Telecommunications Managers," invited paper, Center for Telecommunications Management, University of Southern California, October 1989.

"Price Cap Regulation and Economic Forecasting," invited presentation to 1989 National Forecasting Conference, Bell Communications Research, San Francisco, May 1989.

"The Strategic Implications of Telecommunications Deregulation in Europe," invited presentation, Strategic Management Society, Amsterdam, October 1988.

"Telecommunications Deregulation: Implications for the California Economy," invited presentation, California Foundation for the Environment and the Economy, Carmel, June 1988.

"A Comparison of U.S. and Japanese Policies toward Information Technologies," invited presentation, International Public Economics Association, Tokyo, May 1988.

"Information Technologies, Public Policy, and Regional Economic Development," invited address, Conference on Regional Development in Japan, Hokkaido University, Sapporo, Japan, May 1988.

"The Implications of Line-of-Business Regulation for Diversification Strategy & Enterprise Structure," presented to Strategic Management Society, Boston, October 1987.

"Alternative Regulatory Frameworks for Local Exchange Carriers," invited presentation, En Banc Hearing of the California Public Utility Commission, September 1987.

"Emerging Telecommunications Policies in Europe," Briefing of California Legislative Leaders, Los Angeles, September 1987.

"Japanese Corporate Philanthropy in the United States," presented to Academy of Management, New Orleans, August 1987; Center for Research in Management Working Paper BPP-23; published in summary form in *Strategic Directions*, with Barbara Lombardo and David Vogel, April 1989.

"The Effects of Deregulation on Competition and Competition Policy in Banking: A Review of the Literature." Working Paper No. 4, National Center for Financial Services, Berkeley, August 1987.

"Competitive Strategies under Regulatory Constraint: Implications of the AT&T Divestiture on Vertical Relations in Telecommunications," with David J. Teece, paper presented to Strategic Management Society, Singapore, 1986.

"The Economic Consequences of Deregulation," invited address, Emerging Issues Program, Conference of National State Legislative Leaders, Los Angeles, September 1986.

"Public Policies toward Utility Diversification: An Overview," invited presentation, California Policy Seminar/California Senate Office of Research, Berkeley, April 1986.

"New Technologies for Local Loop Access: An Economic and Regulatory Analysis," with Gary Pisano, Office of Technology Assessment, United States Congress, June 1985.

"Corporate Community Involvement in the Greater San Francisco Bay Area," with D. Vogel and J. Logsdon, Center for Research in Management Working Paper, Berkeley, May 1985.

"The Future of Telecommunications Regulation," invited presentation, En Banc Hearing of the California Public Utilities Commission, San Francisco, November 1984.

"Testimony in Support The Taxpayer Antitrust Enforcement Act," Judiciary Committee, U.S. Senate, May 1984.

ADMINISTRATIVE POSITIONS, UNIVERSITY OF CALIFORNIA

WALTER A. HAAS SCHOOL OF BUSINESS

Chair, Business and Public Policy Group (1983-84, 1986-93).
Policy and Planning Committee (1986-88; 1991-93); Chair (1987-88; 1992-93).
Chair, Program in Business and Social Policy (1986-90).
Business School Building Program Committee (1986-91).
Ph.D. Field Advisor, Business and Public Policy (1981-87; 1989-91).
Policy and Planning Committee (1991-3; Chair, 1992-93).
Member, Board of Directors, Washington Campus Program (1990-93).
Director, The Executive Program (1983-85).
Director, Executive Programs in Telecommunications (1989-92).
Chair, Executive Education Task Force (1991-93).
Member, Board of Directors, Berkeley Center for Executive Development

UNIVERSITY OF CALIFORNIA, BERKELEY

Executive Committee, Center for Research in Management (1989-).
Advisory Board, Lester Center for Innovation and Entrepreneurship (1992-).
Chancellor's Advisory Committee on Parking (1988-89).
Executive Committee, National Financial Services Center (1986-88).
Executive Committee, Institute of Transportation Studies (1981-83).
Director, Center for Transportation Policy Research (1980-2).

UNIVERSITY OF CALIFORNIA, SYSTEMWIDE

Working Group on Technology Transfer (1988-90).
Task Force on Telecommunications and Information Policy Research (1984-85).

PROFESSIONAL AFFILIATIONS

American Economic Association
Academy of Management
Strategic Management Society
International Telecommunications Society
Association of Public Policy Analysis and Management

SERVICE TO PROFESSIONAL JOURNALS, SOCIETIES & PUBLIC AGENCIES

Governor's Ad Hoc Committee, Golden State Quality Awards (1991-92)
Chair, Ninth Annual International Conference of the Strategic Management Society, 1989, San Francisco
Associate Editor, California Management Review
Associate Editor, Logistics and Transportation Review
Editorial Advisory Board, Transportation Research
Session organizer, Telecommunications Policy Research Conference (1988, 1989)
Session organizer, Academy of Management (1991).
Reviewer/Referee: Bell/RAND Journal of Economics; Industrial and Corporate Change; Journal of Asian Economics; Journal of Economics and Business; Journal of Public Policy Analysis & Management; Journal of Regulatory Economics; National Science Foundation; Quarterly Review of Economics and Business; Review of Economics and Statistics; Telecommunications Policy.

CONSULTING & TESTIMONY

Economic Consulting to Public Agencies:

California Department of Consumer Affairs (industry analysis; telecommunications policy); California Office of Attorney General (antitrust analysis in tire industry, merger analysis in food retailing industry, resale price maintenance in consumer electronics, infant formula pricing); California Public Utilities Commission (teach regulatory economics & policy to Commission staff); Interstate Commerce Commission (rate regulatory policy, merger policy, costing methodology); Office of Technology Assessment (telecommunications policy); U.S. Department of Transportation (railroad industry rationalization, merger policy); U.S. General Accounting Office (transportation policy).

Economic Consulting/Regulatory Expert Testimony to Private Enterprise:

Pacific Bell (product pricing, competitive strategy, regulatory policy, broadband deployment, MFJ interLATA relief); US WEST (regulatory policy, costing and pricing principles); Ameritech (price regulation; local competition policy); General Telephone (pricing, regulatory policy); Western Coal Traffic League (railroad pricing); Consolidated Freightways (motor carrier pricing); Southern Pacific Transportation Co. (route rationalization analysis; rail merger analysis; pricing of trackage rights); American Presidents Intermodal Co. (competition policy, merger analysis); Bell Communications Research (R&D policy analysis); Bell Atlantic (price regulation, cable rate regulation; cellular telephone joint venture); Southwestern Bell (price regulation, local competition policy); BellSouth (price regulation, local competition policy); NYNEX (FCC spectrum auction rules); United States Telephone Association (FCC price regulation); MFJ Task Force (MFJ manufacturing relief).

Economic Consulting/Business Litigation Expert Witness Testimony:

Electrical contracting; biotechnology manufacturing equipment; pipe fabrication; vision care services; electronic lighting ballasts; motion picture production, distribution and exhibition; regional shopping center development, semiconductor manufacturing equipment; digital-analog converters; workmen's compensation insurance; semiconductor manufacturing; semiconductor manufacturing.

PRIOR/OTHER EMPLOYMENT

Deputy Director, Cost, Economic and Financial Analysis, Bureau of Accounts, Interstate Commerce Commission, Washington, D.C. (on leave, University of California); (1980-81).
Director, ARTRAIN (traveling art education exhibit), Michigan Council for the Arts, Detroit, (1971-72).
President, Young America Corporation (direct marketing of specialty products), St. Louis (1969-71).
Public Relations Consultant (TIME, Inc.; Rockefeller for President Committee; Young Citizens for Humphrey; Student Coalition for Congressional Action), New York and Washington D.C. (1967-69).
Vice President, National Student Marketing Corporation, Washington D.C. (1966-67).
Staff Assistant, Office of the Governor, State of Oregon, Salem (1966).
Public Relations Field Representative, General Motors Corporation, Warren, Michigan (1965).

Before The
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
Price Cap Performance Review for Local Exchange Carriers	)	CC Docket 94-1
Notice of Proposed Rulemaking	)	

AFFIDAVIT OF ALFRED E. KAHN

I. BACKGROUND, QUALIFICATIONS AND SUMMARY

(1) My name is Alfred E. Kahn. I am the Robert Julius Thorne Professor of Political Economy, Emeritus, at Cornell University and Special Consultant to National Economic Research Associates, Inc. My business address is 308 North Cayuga Street, Ithaca, New York 14850.

(2) Among the experiences of mine most pertinent to my submission in this proceeding are that I was Chairman of the New York State Public Service Commission between 1974 and 1977 and of the Civil Aeronautics Board in 1977-78; I am the author of the two-volume The Economics of Regulation, published originally by John Wiley & Sons in 1970 and 1971 and reprinted in 1988 by The MIT Press; I have written and testified extensively on the subject of telecommunications regulatory policy and published a book and numerous articles on antitrust policy. I was a member of the Attorney General's National Committee to Study the Antitrust Laws and the National Commission for the

Review of Antitrust Laws and Procedures. I have been advisor on telecommunications policy to Governor Carey, of New York State, and recently completed service as a member of the Ohio Blue Ribbon Panel on Telecommunications Regulatory Reform and of the New York State Telecommunications Exchange. I attach a copy of my full résumé as an Appendix to this affidavit.

(3) In its consideration of possible refinements and revisions of the rate caps to which Bell Atlantic is subject, which constitute the specific subject of this proceeding, I suggest it is essential that the Commission bear in mind its broader policies for the reform of telecommunications regulation generally, of which the imposition of rate caps has been an important component. The purpose of this submission is--at the risk of telling the Commission things it already knows and reminding it of the policies on which it has already embarked--to place the specific issues raised by the several parties in the broader context of the rapid and fundamental changes that are taking place in the telecommunications industries and the consequent urgent need for continued reform of the way in which it is regulated.

II. THE DEVELOPING COMPETITION IN TELECOMMUNICATIONS

(4) The telecommunications industry is undergoing rapid, fundamental transformation, a transformation extending to what has until recently been the very core of franchised monopoly, the local exchange network and local service. The imminence of ubiquitous competitive challenges to the LECs from cable television companies is the most recent and perhaps most dramatic development: by 1992 their coaxial cable already passed some 93 percent of all American households and their subscribers constituted about 58 percent;[1] and they are clearly planning, often in collaboration with others, to convert their systems to offer two-way switched services. The most striking of these alliances have been with out-of-territory telephone companies--US West's investment in Time Warner, Southwestern Bell's acquisition of the cable properties of Hauser and Bell Canada's investment in Jones Intercable--with the LECs combining their capital and expertise with

[1] "Statistical Abstract of the United States 1993," U.S. Department of Commerce, p. 55 and "Kagan Media Index Historical Data Base," March 23, 1994, p. 10. According to NCTA, cable now passes some 97 percent of all television households and serves over 63 percent. Cable Television Developments, April 1994, 1-A.

the facilities of the cable companies directly to challenge the incumbent local telephone companies. Early fruitions of these developments are the recent announcements by the Southwestern Bell cable system in Montgomery County, Maryland, that it will provide ubiquitous local telephone service in competition with Bell Atlantic and by Time Warner that it will offer local telephone service in Rochester, New York, in direct competition with Rochester Telephone.[2] Almost simultaneously, MFS, one of the largest CAPs, which already has authority to provide local service in Maryland and New York State, announced that it would do so also in Rochester.[3] In addition, nonwireline cellular companies, using the radio spectrum, offer a means of access to a growing body of subscribers alternative to that of the LECs. Subscribers to cellular telephone accounted for 11.5 percent of all households in 1992 and are growing at some 46.5 percent a year.[4] This trend explains AT&T's planned acquisition of McCaw cellular and MCI's $1.5 billion investment in Nextel, another wireless provider. Other potentially even more ubiquitous wireless offerings, such as personal communication services, are on the horizon.

(5) The proliferation of competitive alternatives has been most extensive in the case of LEC access services, where it has been actively supported by this Commission and state regulatory bodies. These growing pressures are not surprising considering that these services, and particularly high volume access services for business customers, are provided in heavily concentrated and relatively small geographic areas and have historically been priced at artificially high levels in order to subsidize residential local rates. These two factors--high geographic concentration and large markups--encourage customers to bypass the LEC facilities. For example, MCI recently announced plans to "wage the biggest war [they] possibly can" on the local telephone companies, including $2 billion of investment

---

[2] "Southwestern Bell Plans Phone Service For Its Cable Customers in Sibling's Turf," The Wall Street Journal, May 23, 1994; "Time Warner Plans to Provide Switched Telephone Service In Rochester After Approvals Are Received," Time Warner Cable Corp. Affairs, May 16, 1994.

[3] "MFS, Following Time Warner, to Enter Local Phone Market in Rochester, NY," The Wall Street Journal, May 19, 1994, p. B8.

[4] "1993-1994 Telecommunications Market Review and Forecast," North American Telecommunications Association, p. 90. Statistical Abstract of the United States 1993, U.S. Department of Commerce, p. 55. Growth rate is for the period 1989-1992; According to Cable Telecommunications Industry Association (CTIA) there are now 16 million subscribers to cellular service. The Wireless Factbook, Spring 1994, p. 1.

in providing alternative access to long distance providers (such as itself) in the top twenty markets in the country.[5] In addition, competitive access providers (CAPs) provide dedicated access lines in the downtown business districts of virtually every large metropolitan area, linking customers and long-distance carriers, in direct competition with the LECs. CAPs have also begun to add switching capacity to their local networks and switched services to their mix of offerings.[6] The declining cost and increased versatility of switching has likewise made possible the proliferation of privately-owned networks. In consequence, more business phones in the United States are today linked, in the first instance, to their own local exchanges or switches (PBXs) than to those provided by a local telephone company.[7]

III. THE SUPERIORITY OF COMPETITION OVER REGULATED MONOPOLY

(6) There is a broad consensus in the United States, based on experience in industry generally and in telecommunications in particular, that wherever it is feasible, competition is superior to franchised monopoly, however closely regulated, in serving the consumer and public interest. Since this is a conviction that the Commission itself shares and has often expressed,[8] it would be superfluous for me to belabor the point: regulation can, at best, emulate the results of competition in holding or driving prices to cost; but, as practitioners and students of regulation alike have long recognized,[9] traditional regulation,

---

[5] "MCI Proposed a $20 billion Capital Project," The Wall Street Journal, January 5, 1994, p. A3.

[6] "Michigan, Illinois, New York See New Local Competition Action," State Telephone Regulation Report, April 21, 1994, pp. 5-6 and undated MFS Advertisement. See also Order No. 71155, Application of MFS Intelnet of Maryland, Inc. For Authority to Provide and Resell Local Exchange and Interexchange Telephone Service, Case No. 8584 (Md. PSC April 25, 1994).

[7] Peter W. Huber, Michael K. Kellogg and John Thorne, The Geodesic Network II, 1993 Report on Competition in the Telephone Industry (Washington, D.C.: The Geodesic Company, 1992, hereinafter Geodesic Network II), Table 2.2, p. 2.3.

[8] For example, see "Decisions and Reports of the Federal Communications Commission of the United States," Federal Communications Commission Reports, Vol. 96, Second Series, August 1-September 30, 1984, pp. 47-48.

[9] For a review on this, see Kahn, Alfred E., The Economics of Regulation, Vol. II, Chapter 2, See also Noll (1989) (Noll, Roger, "Economic Perspectives on the Politics of Regulation," in Handbook of Industrial Organization, Vol. II, eds. R. Schmalensee and R.D. Willig, Elsevier Science Publishers B.V., 1989).

which has been essentially cost-plus in character, is inherently incapable of ensuring that those costs themselves are minimized; and even reformed, incentive regulation--such as the price caps that the Commission has embraced--is incapable of fully replicating the constant pressures that competition exerts on suppliers to improve their efficiency. Nor can regulated monopoly match the performance of companies subject to the incessant disciplines of competition to innovate--to offer consumers a constantly evolving variety of services and bundles of services, both old and new.

(7) Regulation, no matter how enlightened, is particularly incapable of matching the competitive process in those aspects of performance--crucially important in the technologically dynamic telecommunications industry--that cannot be predicted. The essence of the case for deregulation is the unpredictability of what will prove to be the optimal structure or performance of any industry, and especially one subject to rapid technological change. Market participants under the discipline of the competitive process have an ability to probe the limits of the unpredictable and the unforeseeable and to adapt nimbly if they are to survive that cannot be matched under any regulatory scheme. If and as competition becomes feasible, even if only imperfectly so, the best course is to abandon all direct regulation and concentrate on making competition work as well as possible.

(8) These considerations underline the importance, in this proceeding (and all other such), of the Commission modifying such regulations as continue to be necessary, in ways that duplicate as fully as possible the incentives and processes of competition.

IV. THE CONTINUED NEED FOR REGULATION AND CONSEQUENT DISTORTIONS AND SUPPRESSIONS OF COMPETITION

(9) Competition has not, of course, developed at the same pace in all telecommunications markets, and for this reason regulation will continue to be necessary to protect customers who do not yet enjoy its protection sufficiently. This is particularly true of basic local service to residential and small business subscribers and to some extent of LEC access services to competitors--although, to repeat, large business customers, particularly in concentrated metropolitan areas, already have effective competitive alternatives and recent technological changes permit us to predict with some confidence

that even the former, core business will be subject to increasingly intense, diversified competitive challenges in the near future.

(10) On the other hand, it has become increasingly clear that the particular protections that regulators have enacted in response to these continuing needs have often either been or have become incompatible with efficient competition--either distorting or actually suppressing it.[10]

(11) This has been true, first of all, of the regulatorily-prescribed rate structures of the incumbent telephone companies. Because those structures have generally incorporated deliberate, massive subsidizations of some services--particularly basic local service to residential subscribers and in rural areas--at the expense of others--most prominently access services to businesses in concentrated urban areas and toll--they have created strong artificial incentives for competitors to enter the latter, overpriced markets, whether or not they are the more efficient suppliers.

(12) Second, continuing regulatory restrictions on the LECs--such as required approvals, cost justifications, reporting requirements and restrictions on their prices--bearing on them but not on their competitors, not only handicap them in competing but to this extent also deprive consumers of the full benefits of their possible competition, enabling rivals to obtain business by pricing at levels just below the prevailing regulatorily-prescribed rates. For example, it is surely anomalous, as Bell Atlantic points out, for it to be subject to these kinds of restrictions on its pricing of such very competitive offerings as high-capacity access services.

(13) Such handicaps are often justified, either explicitly or implicitly, on the ground that the entrants require some preferences in order to give them a fair opportunity to enter markets and so eventually to give the public the benefits of competition. Deliberate efforts to "jump start" competition in this way, whether by giving preferences to the entrants or handicapping incumbents, constitute a form of infant industry or infant company protection.

[10] The following discussion draws in part on my "The Uneasy Marriage of Regulation and Competition," Telematics, Washington, DC, September 1984.

(14) While it is not possible to state, as a general proposition, that infant industry protections are unequivocally incorrect, most economists would question their wisdom in most circumstances. First, they inevitably impose immediate costs on consumers and the economy because, by placing restrictions on the freedom of incumbents to compete or higher costs on them than their rivals, they prevent business from being distributed among competitors on the basis of their relative costs. Second, while those costs are tangible and certain, the benefits are not: it is virtually impossible to determine in advance that a would-be competitor both requires and deserves some special preference--that is to say, that the long-term benefits to consumers of the competition encouraged in this way, properly discounted for both their futurity and their uncertainty, exceed the costs. The lesson of history, instead, is that so long as companies are insulated from competition, they are, to that extent and for that reason, less likely ever to "grow up" and undertake to compete without such special protections. The system encourages them, instead, to devote their energies primarily to seeking (before both regulators and the courts) to perpetuate their preferential subsidies and protections. The history of U.S. telecommunications regulation amply confirms the importance and dangers of this kind of continual "rent-seeking." For all these reasons, it is preferable by far to leave determinations of the long-term prospects of new and uncertain ventures to the market generally and to financial markets in particular: if a new venture of this kind is indeed meritorious, the general presumption is that investors will be willing to supply the necessary capital.

(15) This preference is particularly compelling as it relates to would-be competitors in telecommunications, where the principal aspiring entrants are obviously neither newcomers nor "infants." The most prominent ones are either themselves or affiliates of long-distance carriers like AT&T and MCI or cable companies or manufacturers of electronic equipment or of computers, like Motorola. Among the largest competitive access providers are MFS, a subsidiary of a large international construction firm, and Teleport, which is jointly owned by Cox Enterprises, TCI and Time Warner, among others; and, as I have already pointed out, some of the threatening direct competitors of local exchange companies are combinations of the country's largest multiple cable system operators and domestic or foreign telephone companies.

(16) The differences in the price cap regulation applicable to the LECs on the one side and such competitors as AT&T and the cable companies (the latter in alliance in some cases with MCI, in others with large out-of-region telephone companies), on the other, represent another possible source of distortion of the competition between them. Those competitors are subject to "pure" price caps--indexation for inflation less a productivity offset. The LECs' price caps, in contrast, continue to incorporate a number of elements of rate of return regulation, such as "sharing" and "lower bound" adjustments and the use of regulatorily prescribed depreciation rates. As I will explain presently, the pure price cap schemes provide superior incentives for new investment and innovation. In a situation of intensifying competition among these entities, any such impediments to the LECs upgrading their own local networks--to provide superior interconnection for interexchange communications or video services--would presumably subject them to competitive disadvantages unrelated to their potential efficiency, with consequent injury, ultimately, to the consuming public.

(17) Similarly, whatever justification they may have in terms of preventing unfair competition, categorical exclusions of the LECs from offering competitive services--such as the Cable Act's ban on offering video programming in their own service areas and the provisions of the MFJ barring the Bell Operating Companies from offering interLATA services and manufacturing equipment--are inherently anticompetitive. Manifestly, preventing unfair competition by flatly prohibiting competition entirely on the part of its feared perpetrators is the most anti-competitive way conceivable of achieving the desired protection. The costs to the consuming public are probably large because of the versatility of telecommunications technology and the extensive economies of scope--the economies of using common productive facilities and managerial competence to offer a multiplicity of services--that it exhibits.

V. THE DIRECTIONS OF ESSENTIAL REGULATORY REFORM

(18) The adaptation of regulation to the increasingly pervasive intrusion of competition into telecommunications markets is, necessarily, a continuing process. Overall, the trend in the country at large is unmistakably in the direction of a coherent policy of permitting and promoting free and efficient competition by all participants, including the

LECs, and subjecting the latter companies to the discipline and incentives of the market. This means, primarily, abandonment or severe modification of the protectionism of the regulated entities and their distorted price structures entailed in restrictions on competitive entry, on the one side, and of regulatory handicapping of incumbents, on the other. And it means devising methods of regulating services in whose provision competition has not fully developed in ways that protect consumers without incumbering and handicapping their providers in competing elsewhere. Those various adaptations remain only partial and incomplete, however; and inconsistencies, distortions and dilutions of entrepreneurial incentives remain.

A. Substitute direct price for rate-of-return regulation

(19) The Commission, along with most other students of regulation, has already recognized the benefits of substituting direct price for rate-of-return regulation. The most important is that price ceilings mitigate the cost-plus character of traditional regulation and therefore provide the companies with enhanced incentives to be efficient and innovative, and--specifically in the case of telecommunications--to invest in upgrading their infrastructure in order to be able to offer new services. In these various ways, regulation is reformed so as more closely to approximate the ways in which competition works.[11]

(20) So long as the price caps continue to be tested from time to time against the rate of return they produce, as they are under the current plan applicable to the LECs, the perverse effects of cost-plus regulation on the companies' incentives will not be entirely eliminated. The same is true of the provisions for sharing and backstops[12]: they dilute

---

[11]As the FCC stated clearly in 1988,

> This 'price-cap' approach to regulation replicates the competitive process more accurately because it allows carriers to increase their earnings by innovating in the provision of service and reducing their costs. At the same time, the presence of the cap protects ratepayers by limiting carriers' flexibility to increase earnings by raising prices, padding costs or engaging in cross-subsidization. Moreover, in the long run, this system should be less complex to administer and should reduce regulatory costs.

Further Notice of Proposed Rulemaking, In the Matter of "Policy and Rules Concerning Rates for Dominant Carriers", CC Docket No. 87-313, released May 23, 1988.

[12]FCC, Policy and Rules concerning Rates for Dominant Carriers (CC Docket No. 87-313), Report and Order, adopted September 19, 1990.

the complete transfer from ratepayers to shareholders of the risks and benefits of unsuccessful or successful performance. The longer the interval between reexaminations of the price caps and the wider the range of achieved rates of return that regulators, the utility companies and the public can tolerate, the closer will be the approximation to the workings of competition. The ultimate reform is, clearly, to sever the link between costs and rates and to subject the LECs to "pure" price caps, just as the Commission has already done in the case of AT&T and the cable industry.

(21) The extraordinarily great importance of innovation in telecommunications provides the strongest reasons for eliminating all vestiges of rate base/rate of return regulation. By narrowing the range of profits that companies may expect to obtain from such ventures--and, as part of the same process, by typically permitting the current recovery of depreciation at rates widely recognized as unrealistically low for industries subject to rapid technological change[13]--those remaining elements of rate of return regulation tend to inhibit the undertaking of risky innovations.[14] This damping tendency is accentuated by the understandable reluctance of regulators fully to pass on to ratepayers the sometimes very large costs of ventures that turn out unsuccessfully. Those remaining elements therefore have a tendency not merely to narrow the range of expected profit outcomes but to do so asymmetrically--giving rise to an expectation that risk-taking companies may be denied the ability to recover the costs of unsuccessful ventures while being denied also the ability fully to retain the offsetting profits of successful ones.

(22) The competitive ideal is that risks of innovative ventures be borne not by ratepayers but by investors. In this model, ratepayers are not required to bear the losses stemming from unsuccessful investments; by the same token, neither are they permitted to appropriate the profits stemming from successful ones. The converse of this proposition

---

[13]See Kahn *The Economics of Regulation*, Vol. 1, pp. 117-122, "Depreciation Policy and Technological Progress," and Vol. 2, pp. 146-47, 149-50.

[14]I observed this tendency more than 20 years ago, while at the same time offering the opinion that its practical effect was probably slight. Ibid., Vol. 1, pp. 53-54. This was however before some of the large write-offs of the 1980s. See also Crandall, *After the Breakup: U.S. Telecommunications in a More Competitive Era*, Washington, DC: Brookings Institution, 1991, Chapter 3.